

What is claimed is:

1. A gas sensor comprising:
  - a hollow cylindrical housing having an open end;
  - 5 a sensor element disposed within said housing, said sensor element having a sensing portion projecting from the open end of said housing; and
    - a cover assembly made up of an outer cylindrical cover and an inner cylindrical cover each of which includes an open end portion and a body portion, the body portion of the inner cylindrical cover being disposed within the body portion of the outer cylindrical cover in a non-contact fashion, the open end portion of at least one of the outer and inner cylindrical covers having a shoulder which is placed in contact with the open end portion of the other cylindrical cover to establish a positional relation between said cover assembly and said housing which defines portions of the outer and inner cylindrical covers installed on an end side wall of said housing continuing from the open end thereof.
  - 20 2. A gas sensor as set forth in claim 1, wherein the open end portion of each of the outer and inner cylindrical covers has a side end wall greater in diameter than the body portion and a shoulder formed between the side end wall and the body portion, the shoulder of the inner cylindrical cover being placed in contact with the shoulder of the outer cylindrical cover to establish a positional relation between the open end portions of the outer and inner

cylindrical covers which defines a given lap of the side end walls of the outer and inner cylindrical covers which is joined to the end side wall of said housing continuing from the open end thereof.

- 5       3. A gas sensor as set forth in claim 1, wherein said housing has a large-diameter portion and a small-diameter portion on which the end side wall is defined and a step formed between the large-diameter portion and the small-diameter portion, and wherein the open end portion of the inner cylindrical cover has a
- 10      side end wall bent outward to define the shoulder, the shoulder being placed in contact with the step of said housing while the open end portion of the outer cylindrical cover is placed in contact with the shoulder of the inner cylindrical cover to defines a lap of the open end portions of the outer and inner cylindrical covers
- 15      installed on the end side wall of said housing.
4. A gas sensor as set forth in claim 1, wherein the open end portion of the outer cylindrical cover has a side end wall and the shoulder formed between the side end wall and the body portion,
- 20      the open end portion of the inner cylindrical cover having an end wall bent outward to define a flange which is placed in contact with a surface of the open end of said housing and which engages at an end thereof with the shoulder of the outer cylindrical cover to secure a given lap of the open end portion of the outer cylindrical
- 25      cover over the end side wall of said housing for installation of said cover assembly on said housing.

5. A gas sensor as set forth in claim 1, wherein  
the open end portion of each of the outer and inner cylindrical  
covers has a side end wall and a shoulder formed between the side  
5 end wall and the body portion, the side end wall of the inner  
cylindrical cover abutting at an end thereof on the open end of said  
housing, the shoulder of the inner cylindrical cover being placed in  
contact with the shoulder of the outer cylindrical cover to secure a  
given lap of the side end wall of the outer cylindrical cover over the  
10 end side wall of said housing for installation of said cover assembly  
on said housing.

6. A gas sensor as set forth in claim 1, wherein the shoulder of  
the open end portion of the one of the inner and outer cylindrical  
15 covers is placed in contact with the open end portion of the other  
cylindrical cover on a plane extending substantially perpendicular  
to a longitudinal center line of said cover assembly to secures areas  
of the outer and inner cylindrical covers installed on the end side  
wall of said housing.

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7. A gas sensor as set forth in claim 6, wherein the inner  
cylindrical cover is disposed within the outer cylindrical cover  
coaxially with each other, the shoulder of the open end portion of  
the one of the inner and outer cylindrical covers is placed in  
25 annular line contact with the open end portion of the other  
cylindrical cover.

8. A gas sensor comprising:

a hollow cylindrical housing having an open end in which a groove is formed;

5        a sensor element disposed within said housing, said sensor element having a sensing portion projecting from the open end of said housing;

10      a cover assembly made up of an outer cylindrical cover and an inner cylindrical cover each of which includes an open end portion and a body portion, the body portion of the inner cylindrical cover being disposed within the body portion of the outer cylindrical cover in a non-contact fashion, the open end portions of the outer and inner cylindrical covers having outwardly extending shoulders, respectively, which are placed in contact with each other and fitted 15     within the groove of said housing; and

an extension formed around the groove of said housing, said extension being bent to urge the shoulders of the outer and inner cylindrical covers into engagement with each other to install said cover assembly on said housing.

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9. A gas sensor as set forth in claim 8, wherein said extension is welded to the shoulders of the inner and outer cylindrical covers so that a tip of the weld lies within a thickness of the shoulder of the inner cylindrical cover.

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